Renal MR Angiography

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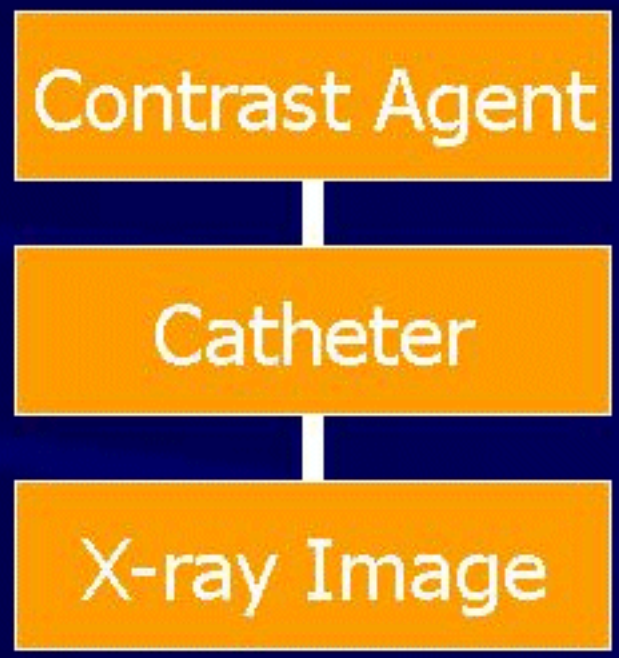
Comparison With Conventional Angiography



Conventional Angiography is performed by introducing an X-ray opaque contrast material into arteries via a catheter, and making an X-ray images of the contrast material.

Conventional Angiography

- Disadvantages
  - Invasive technique
  - Catheter induced complications(e.g. infection, hematoma or bleeding)
  - Recovery period at least 4-6 hours
  - Renal damage
  - Stroke

Renal MR Angiography

- The imaging technique used to identify vessels of the kidney
- Non-invasive, high resolution without arterial catheterization or nephrotoxicity
- Outpatient technique for evaluating renal vascular pathology
- Also offers a functional approach to the assessment of vascular disease

How to Perform Renal MRA

- Renal MRA is performed in a 20-30 sec acquisition during breath holding in coronal plane after intravenous bolus injection of a contrast agent (gadolinium chelate) during the arterial phase, and venous or equilibrium phases
- Phase Contrast MRA employed as a part of the study to assess the hemodynamic and functional significance of the renal arterial stenosis

The Basic Principles of Contrast-Enhanced MRA

The shortening of the T1 Relaxation time
of the blood in the vessels relative to the surrounding tissue
when a paramagnetic contrast agent (Gadolinium Chelates)
is injected into the blood

T1 Relaxation Time

Relative to

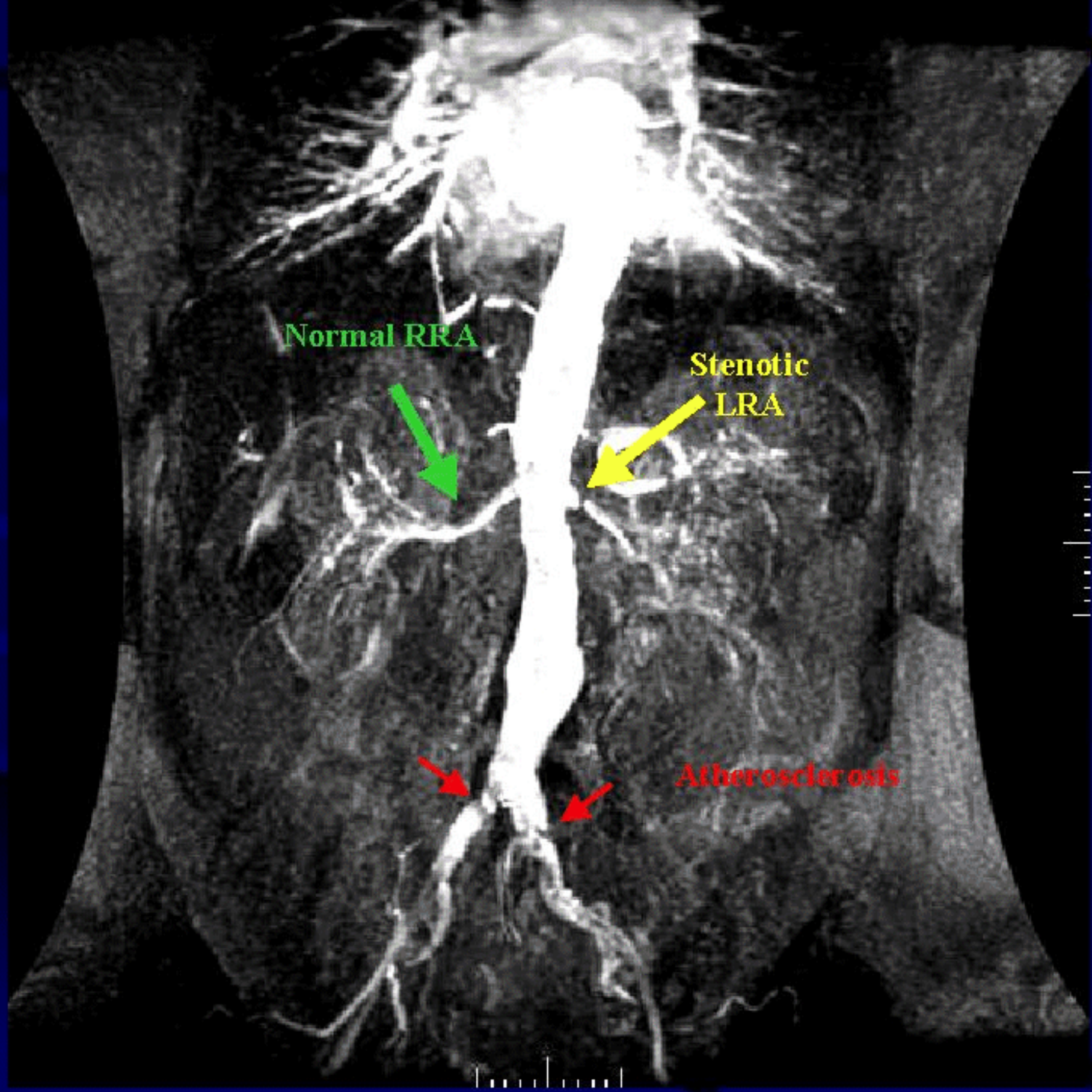
Surrounding Tissue

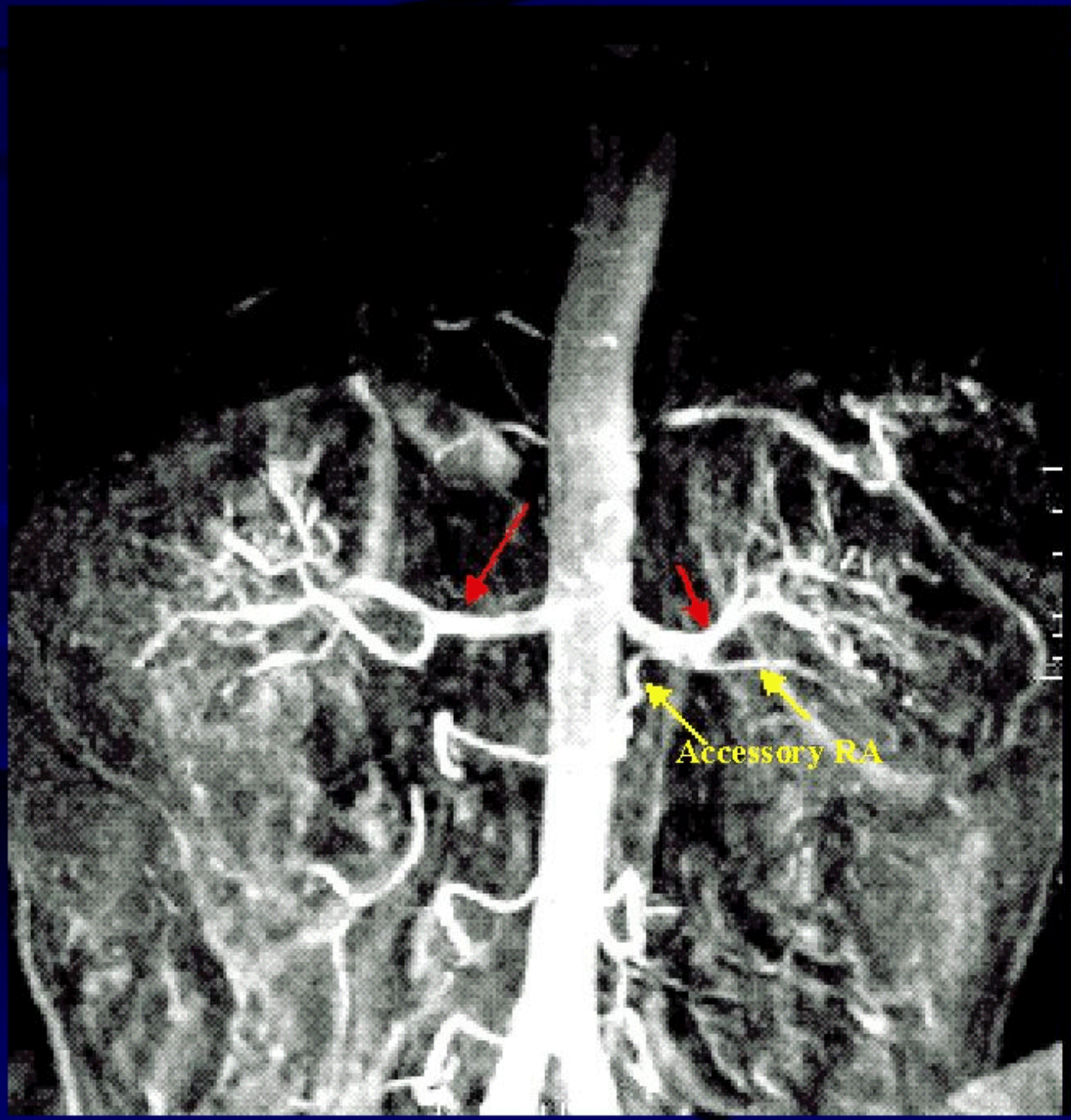
Renal MR Angiography Used in Assessing

- Renal artery stenosis in patients with high BP
- Preoperative mapping(e.g. renal revascularization, renal bypass grafts, repair of aortic aneurysm)
- Vascular involvement by renal tumors
- Potential renal donors and recipients
- Patients with allergy to iodinated contrast agent or difficult arterial access.
- Kidney/Pancreatic Transplant

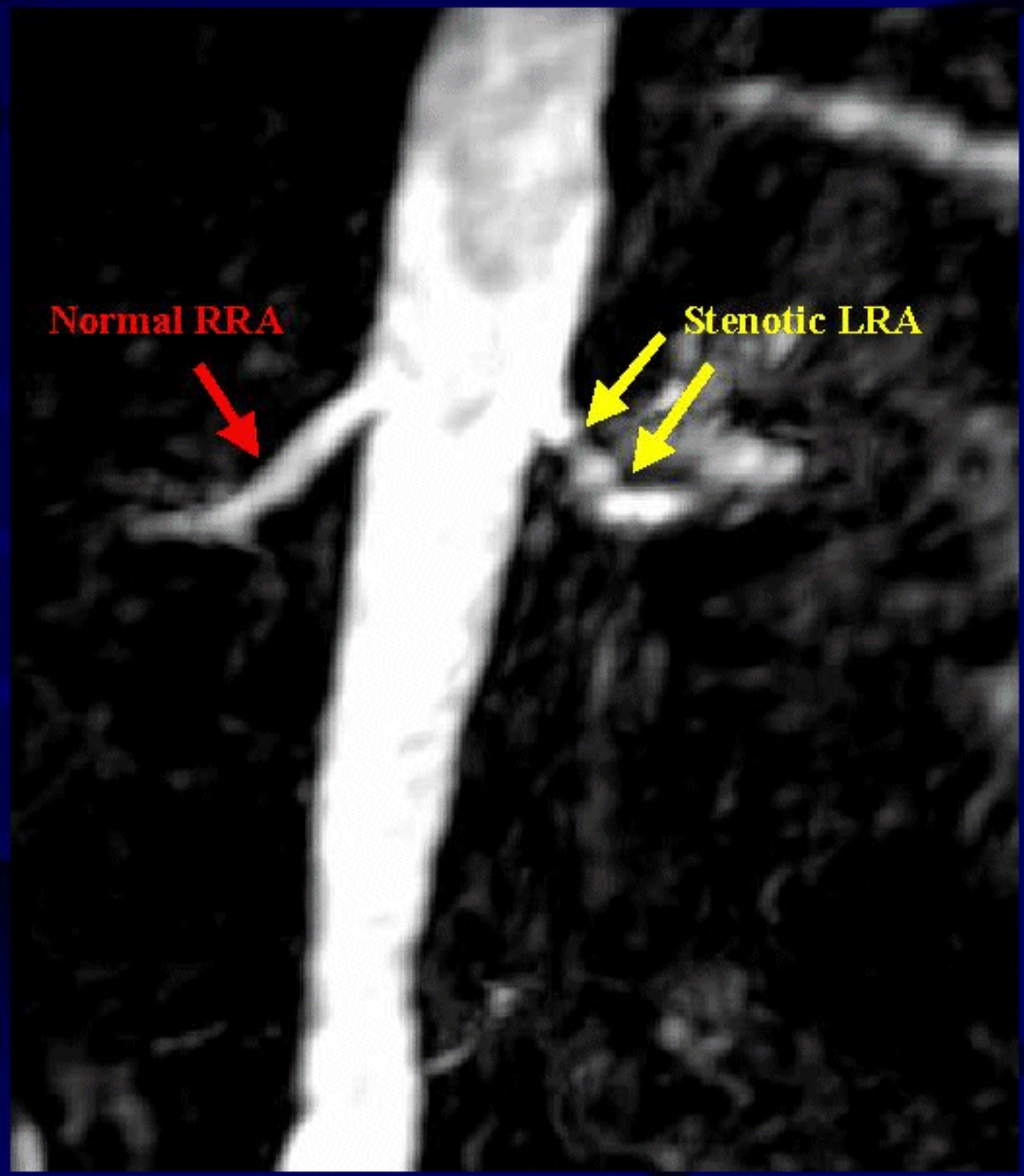
Advantages of Renal MRA

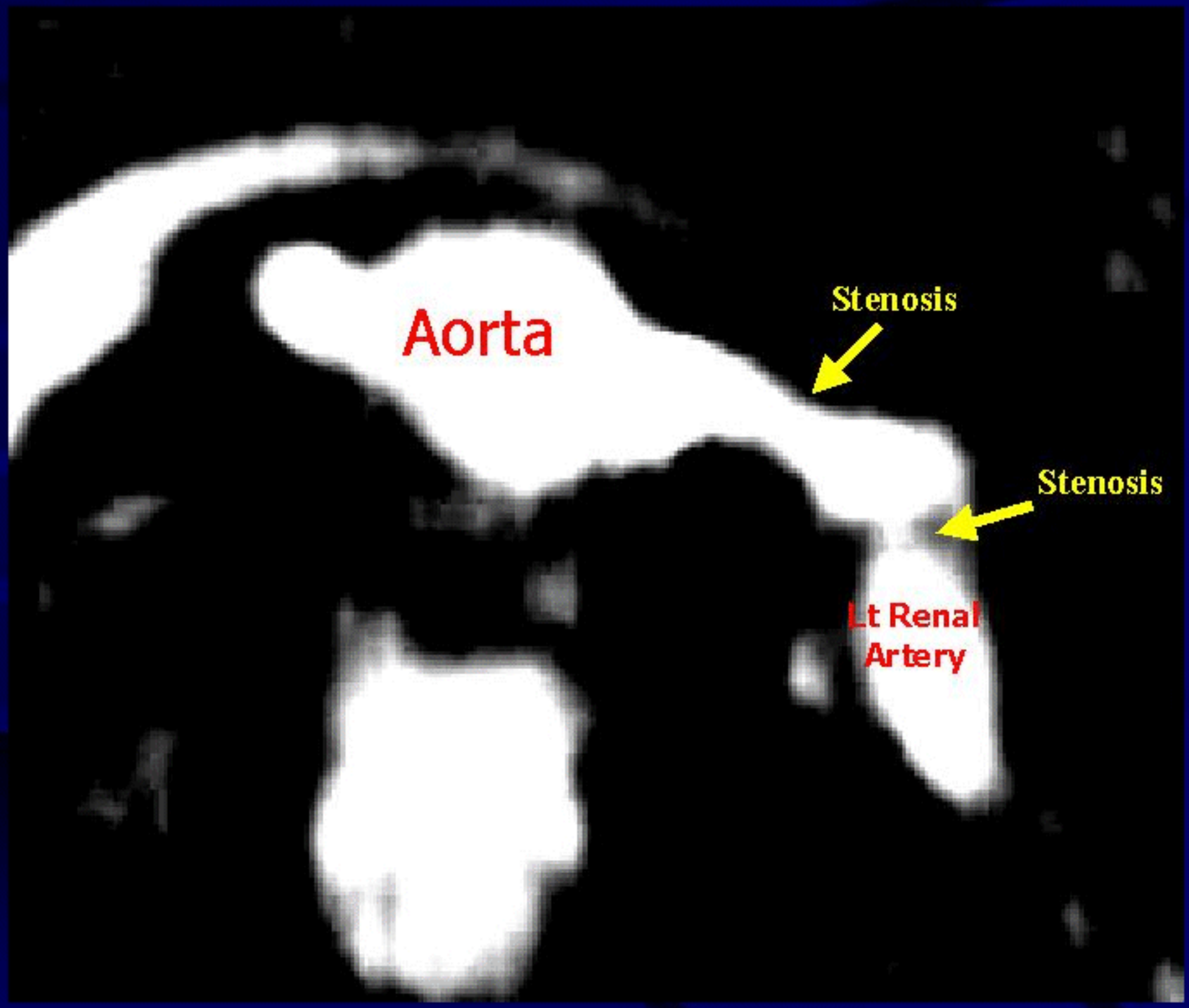
- Non-invasive technique
- Catherization is not required
- No radiation exposure
- No risks of allergy or nephrotoxicity to contrast agent (iodine compounds)
- Can be performed **+/-** contrast material
- Can be an alternative **or** replacement for Conventional Angiography

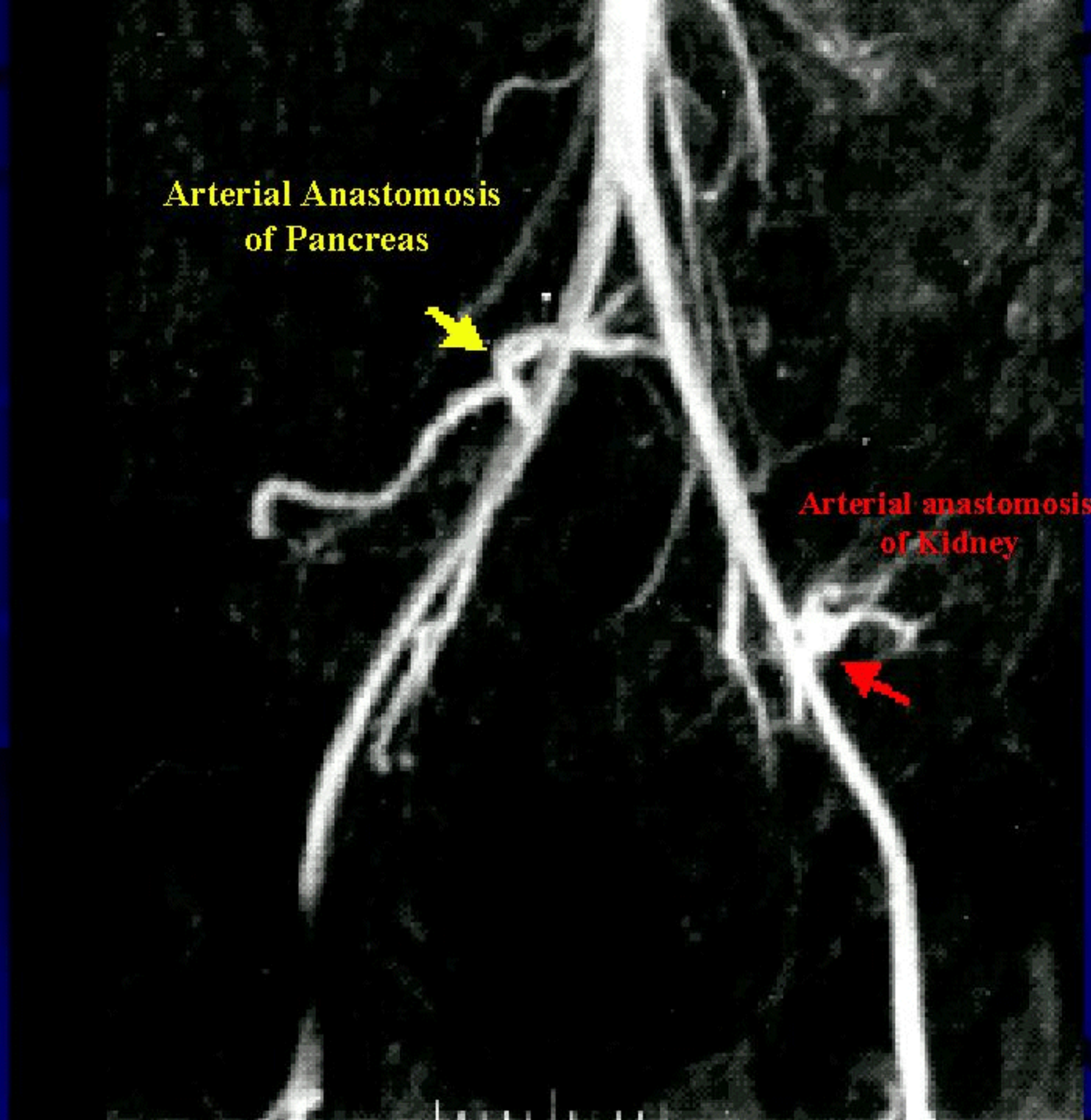

Normal RRA
Stenotic
LRA
Atherosclerosis

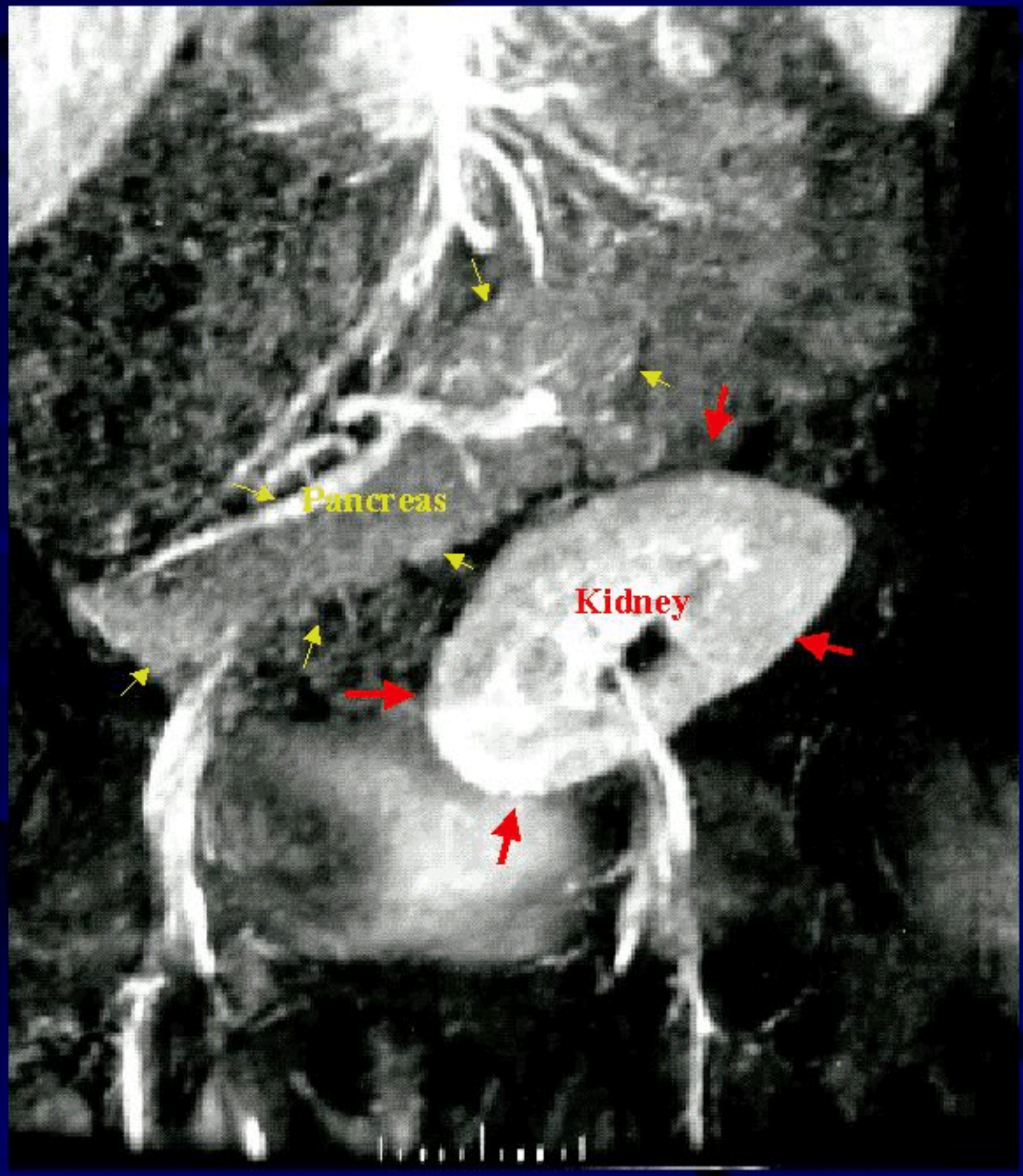

Accessory RA


Accessory LRA


Normal RRA
Stenotic LRA


Aorta
Stenosis
Stenosis
Lt Renal
Artery


Arterial Anastomosis
of Pancreas
Arterial anastomosis
of Kidney


Pancreas
Kidney

Summary

- Effective non-invasive screening modality for assessing renal artery disease in patients with
  - hypertension
  - declining renal function
  - kidney transplant
- Efficient test for evaluation of potential renal donors